

WHAT IS CLAIMED IS:

1. A method of securing a pile member in soil that has an upper layer of very unstable material and a second lower layer of semi-stable material, comprising the steps of:
 - 5 a) introducing a first tubular pile member having a terminating end into the soil, such that said terminating end is situated below the very unstable material;
 - b) pumping cement-based grout, under controlled pressure, through said tubular pile member and into the semi-stable material in said second layer, said grout forming a grout mass below the tubular member;
 - 10 c) lowering said pile member into said grout mass.
2. A method of securing a pile member in soil having a first unstable upper layer and a second lower semi-stable layer, to support a pile member, comprising the steps of:
 - 15 a) introducing a first tubular pile member such that said pile member extends through the first unstable upper layer of soil and said pile member terminates at an end positioned within said second lower semi-stable layer;
 - b) introducing a second tubular member inside of said first tubular pile member, and inserting it deeply enough that its terminating end is positioned below the terminating end of said first tubular member;
 - 20 c) introducing cement-based grout under controlled pressure through said second tubular member;
 - d) withdrawing said second tubular member as grout is pumped therethrough, yielding a generally columnar grout formation that is generally in vertical alignment with and substantially below said first tubular member; and
 - 25 e) lowering said pile member into said grouted material.